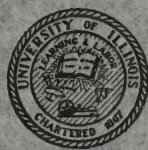


UNIVERSITY OF ILLINOIS



ENTRANCE EXAMINATION

Plane Geometry

One Unit.
Time, 2 hours.

Answer any three of Set A and any four of Set B.

SET A.

1. State and prove the converse of the following theorem: If two parallel lines are cut by a transversal, the alternated interior angles are equal.
2. Prove that two triangles are similar if an angle of one is equal to an angle of the other and the including sides are proportional.
3. Prove that if two chords intersect within a circle, the product of the segments of one is equal to the product of the segments of the other.
4. Prove that the area of a parallelogram is equal to the product of its base by its altitude.

SET B.

5. Show how to construct a perpendicular to a line at a given point in the line.
6. Show how to construct a tangent to a circle through a given external point.
7. The areas of two similar triangles are to each other as 64 to 81. The sides of the smaller triangle are 11, 13, and 17. Find the length of the sides of the larger triangle.
8. In a circle whose radius is 5 inches, chords 8 inches long are drawn. What is the locus of their mid points?
9. Show that the mid point of the hypotenuse of the right angle triangle is equidistant from the three vertices.

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SET B.

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